Seattle Journal of Environmental Law

Volume 1 | Issue 1 Article 2

5-31-2011

Global Warring and Permanent Dry: How heat threatens human security in a warmer world

Jennifer Marlow

Jennifer Krencicki Barcelos

Global Warring[1] and the Permanent Dry[2]: How heat threatens human security in a warmer world

Jennifer Marlow & Jennifer Krencicki Barcelos[†]

I. INTRODUCTION

A. Our Heat Hypothesis

Heat is a more ubiquitous indicator of the problems facing humanity in a warmer world than rising sea levels and the impending climate refugee crisis. Adaptation policies that respond to the threats from heat should promote human security as the best means for addressing climate vulnerabilities that threaten human rights and global stability.

The climate refugee crisis has captured global attention for good reason. The citizens of island nations such as the Maldives, Tuvalu, and Kiribati are deemed to become some of the world's first climate refugees as their lands—in some places just 1.5 meters above sea level—slowly become engulfed by rising seas. Facing existential threat, the fate of small-island states is apparently and despicably debatable as the world's most wealthy economies refuse to commit to legally binding greenhouse gas emissions reductions. Leaders of small-island nations have worked tirelessly to shift the climate policy debate away from technical market fixes toward the human impacts of climate change as rising seas threaten their very survival.

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1. Phrase coined by Cleo Paskal, Associate Fellow at Chatham House (the Royal Institute of International Affairs). CLEO PASKAL, GLOBAL WARRING: HOW ENVIRONMENTAL, ECONOMIC, AND POLITICAL CRISES WILL REDRAW THE WORLD MAP (Palgrave Macmillan 2010).

2. Susan Solomon et al., *Irreversible Climate Change Due to Carbon Dioxide Emissions*, 106 PROC. OF THE NAT'L ACAD. OF SCI. OF THE U.S. 1704, (Feb. 10, 2009). *See also* Joe Romm, Climate Progress Blog, Sept. 6, 2007, http://climateprogress.org/2007/09/06/australia-faces-the-permanent-dry-as-do-we/.

† Jennifer Marlow and Jennifer Krencicki Barcelos received their J.D.s from the University of Washington School of Law, and are Co-Executive Directors of the Three Degrees Project at the University of Washington School of Law. The authors would like to offer their most sincere gratitude to the mentors who have inspired them: William H. Rodgers, Jr., Mary Robinson, Kellye Testy, Joel Ngugi, Louis Wolcher, Michele Storms, David Battisti, Gus Speth, Mickey Glantz, Stephen Gardiner, Alex Steffen, Michael Robinson-Dorn, and Peter Sauer. The authors accept full responsibility for the content of this article.

Thus, small island states have come to symbolize climate justice for the media, lawmakers, and activists. However, the narrow focus by media, law and policy makers, and organizations such as our own on island nations as the only illustration of climate justice is dangerously simplistic. Like the tragic image of a polar bear precariously balancing on the only tiny iceberg in sight, the heavy focus on sea level rise obscures other physical and societal changes that provide a more complete understanding of climate impacts. The popular focus on climate refugees ignores 1) the pervasive role of heat as well as non-climate threats in creating rising instability and global migration over time, 2) the links between those who leave and those who stay, and 3) global hot spots for climate justice—places where complex layers of human, social, and political conflict complicate the causality of climate change in threatening human security and well-being.[3] (See fig. 1).

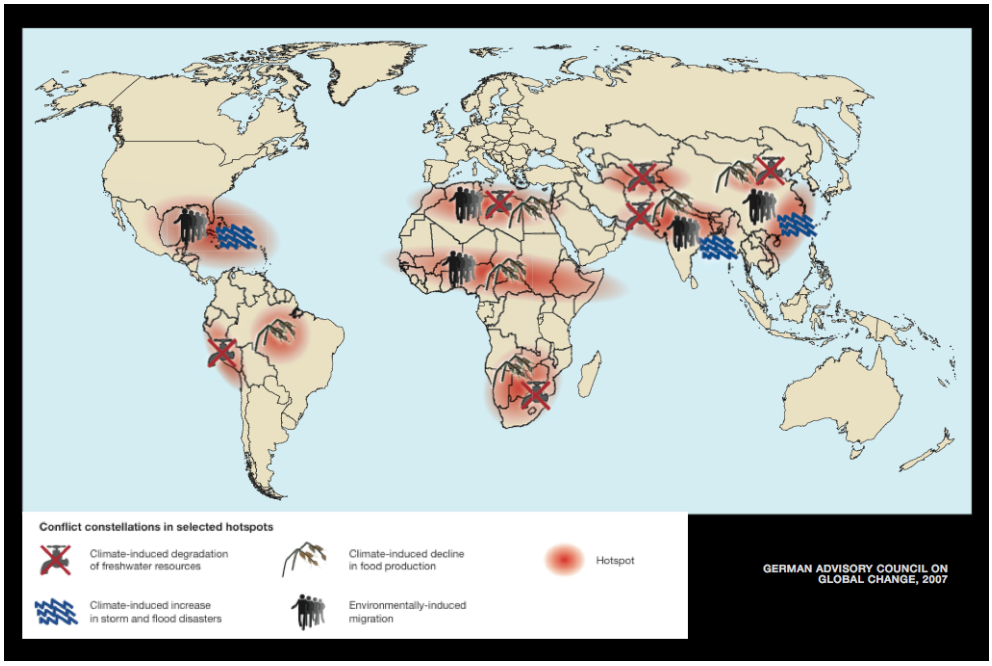

Figure 1. Global hot spots, shaded, should receive greater attention due to the potential security risks triggered by overlapping climate impacts.[4]

3. RENATE SCHUBERT ET AL., CLIMATE CHANGE AS A SECURITY RISK, GERMAN ADVISORY COUNCIL ON GLOBAL CHANGE, May 2007, at 4, http://www.wbgu.de/wbgu_jg2007_engl.pdf.

4. *Id.*

This essay will attempt to correct the oversimplification of climate justice as a crisis culminating in waves of climate refugees. Instead, we focus on how heat increases vulnerability of cultures, institutions, lifestyles, occupations, human rights, and community viability due to *both* rising global average temperatures and the resulting destabilizing societal consequences of inequity in a warmer world. It will illuminate the ways in which heat is the biggest climate-driven threat to global human security, particularly in non-island regions and states where social stability and improved development hold tremendous geopolitical importance. The essay will then discuss ways in which current legal and political responses are inadequately prepared to handle heat vulnerability. We propose that human security should become a central factor in new institutions being conceived around climate-induced social and political issues, ranging from crop failure to, in a worst-case scenario, voluntary or forced climate-induced displacement.

B. Why a Focus on Heat Is Useful for Framing Human Needs in a Warmer World

For now, these hot days, is the mad blood stirring.[5]

—William Shakespeare

Approaches to climate adaptation too often neglect slow-onset climatic changes such as heat stress,[6] while more dramatic events such as disappearing islands and floods of migrating "climate change refugees"[7] receive exaggerated levels of attention. This misplaced attention is significant for several reasons. First, there is very little empirical evidence suggesting that climate change has caused migration.[8] Second, more

5. WILLIAM SHAKESPEARE, ROMEO AND JULIET, act 3, sc. 1 (Wordsworth Editions Ltd 1996) (1596).

6. Graeme Hugo, *Climate Change-Induced Mobility and the Existing Migration Regime in Asia and the Pacific* at 11, *in* CLIMATE CHANGE AND DISPLACEMENT: MULTIDISCIPLINARY PERSPECTIVES 9, 11 (Jane McAdam ed., 2010).

7. There is no universally agreed upon definition of a "climate refugee." The definition we use is that a "climate change refugee" is "an individual who is forced to flee his or her home and to relocate temporarily or permanently across a national boundary as the result of sudden or gradual environmental disruption that is consistent with climate change and to which humans more likely than not contributed." *See* Bonnie Docherty & Tyler Giannini, *Confronting a Rising Tide: A Proposal for a Convention on Climate Change Refugees*, 33 HARV. ENVTL. L. REV. 349, 361 (2009). The 1951 Refugee Convention defines a refugee as someone with a "well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion." *See* Convention Relating to the Status of Refugees, opened for signature July 28, 1951, 189 U.N.T.S. 150, art. 1(A)(2).

8. Stephen Castles, *Afterword: What now? Climate-Induced Displacement after Copenhagen*, in CLIMATE CHANGE AND DISPLACEMENT: MULTIDISCIPLINARY PERSPECTIVES 239, 244 (Jane McAdam ed., 2010).

people will be affected by heat than forced migration from Pacific island nations. For example, sixty-eight percent of people living in the Pacific islands live in Papua New Guinea, but most of Papua New Guinea's population lives inland.[9] Thus, impacts such as temperature changes and shifts in precipitation patterns will be more important for adaptation than sea level rise alone.[10]

Despite the very real impacts of climate change on peoples forced to migrate, heat is a chronic, undervalued threat to human communities everywhere. A recent study concluded that over the next twenty to fifty years, warmer temperatures will cause drier conditions and persistent droughts in many highly populated regions around the world.11 Dr. Aiguo Dai, who conducted the study, spoke of the significance of the results: "If the projections in this study come even close to being realized, the consequences for society worldwide will be enormous."12 What are these consequences for society? NASA scientist James Hansen has warned that international efforts to cap warming to under two degrees Celsius may not be ambitious enough to avoid dangerous tipping points.13 James Lovelock, well-known for his Gaia hypothesis,14 warns of the near-extinction of the human species. Lovelock paints a vivid picture of Hansen's danger scenario:

> [I]n the hot arid world survivors gather for the journey to the new Arctic centers of civilization; I see them in the desert as the dawn breaks and the sun throws its piercing gaze across the horizon at the camp. The cool fresh night air lingers for a while and then, like smoke, dissipates as the heat takes charge. Their camel wakes, blinks and slowly rises on her haunches. The few remaining mem-

9. It must also be noted, however, that plans exist to voluntarily resettle most of the Carteret Islands' population of 3,300. *See* Ursula Rakova, *How-to Guide for Environmental Refugees*, Our World 2.0 United Nations University Blog (June 16, 2009), http://ourworld.unu.edu/en/how-to-guide-for-environmental-refugees/.

10. Castles, *supra* note 8, at 244 (*citing* Richard Bedford, Director of the Population Studies Centre of the University of Waikato, New Zealand).

11. Aiguo Dai, *Drought Under Global Warming: A Review*, WILEY INTERDISCIPLINARY REVIEWS: CLIMATE CHANGE (advanced review), *available at* http://onlinelibrary.wiley.com/doi/10.1002/wcc.81/pdf.

12. Peter Applebome, *Ignoring the Planet Won't Fix It*, N.Y. TIMES, Oct. 27, 2010 (quoting Aiguo Dai), *available at* http://www.nytimes.com/2010/10/28/nyregion/28towns.html.

13. *See* James Hansen et al., *Target Atmospheric CO(2): Where Should Humanity Aim?*, 2 OPEN ATMOSPHERIC SCI. J. 217, 217-18, 226 (2008).

14. The Gaia Hypothesis imagines the planet as a self-regulating life-system. *See* JAMES LOVELOCK, GAIA: A NEW LOOK AT LIFE ON EARTH (Oxford University Press 2000).

> bers of the tribe mount. She belches, and sets off on the long unbearably hot journey to the next oasis.[15]

In our work, we often say that climate change creates winners and losers. For example, high altitude climates are predicted to be climate "winners" for many reasons, a major one being that agricultural productivity is expected to increase in northern climates.[16] However, a "winners versus losers" mentality is overly simplistic. Arctic communities such as the native village of Kivalina, Alaska, are tasked with finding their own funds to permanently relocate because of melting permafrost and eroding coastal shorelines due to anthropogenic climate change.[17] Lovelock's unforgiving portrayal of the "winner"—a barren refugee camp in the Arctic desert—is important because it does not overlook the complexities of climate change issues. Admittedly, it is also quite bleak.

Lovelock's end myth for human civilization may seem sensationalized and a figment of pure science fiction. But for those who doubt its possibility, it is worth noting that current levels of atmospheric carbon dioxide concentrations almost identically mimic the atmospheric concentrations during the Pliocene period, an era three million years ago when the North Pole was ice-free and temperatures in the Arctic were nearly three degrees Celsius warmer.[18] Three degrees Celsius is the approximate global average temperature rise predicted for the year 2100 by the Intergovernmental Panel on Climate Change (IPCC)[19]—the most rigorously peer-reviewed scientific body in history.[20] Although the Pliocene may not be a perfect analogue for the future, at least it is a window through which we can view a possibility.

Lovelock's vision of the future certainly lacks the optimism and political salience required to cater to an American electorate stacked with shortsighted leaders and misguided patriots. But it teaches us that a

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15. JAMES GARVEY, THE ETHICS OF CLIMATE CHANGE: RIGHT AND WRONG IN A WARMING WORLD 30 (Continuum International Publishing Group 2008) (quoting JAMES LOVELOCK, THE REVENGE OF GAIA (Penguin Books 2006)).

16. WILLIAM R. CLINE, GLOBAL WARMING AND AGRICULTURE: IMPACT ESTIMATES BY COUNTRY (Peterson Institute for International Economics 2007).

17. *See* Native Village of Kivalina v. Exxon Mobil Corp., 663 F. Supp. 2d 863 (N.D. Cal. 2009).

18. MARK LYNAS, SIX DEGREES: OUR FUTURE ON A HOTTER PLANET National Geographic Society 133 (2008) (*citing* A. Haywood & P. Valdes, *Modeling Pliocene Warmth: Contribution of Atmosphere, Oceans and Cryosphere*, EARTH AND PLANETARY SCIENCE LETTERS 218, 363–77 (2004)).

19. R.K. Pachauri & A. Reisinger, CONTRIBUTION OF WORKING GROUPS I, II AND III TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, IPCC, *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

20. Stacy Feldman, *Climate Scientists Defend IPCC Peer Review as Most Rigorous in History*, Solve Climate Blog, Feb. 26, 2010, http://solveclimatenews.com/news/20100226/climate-scientists-defend-ipcc-peer-review-most-rigorous-history.

"winners versus losers" take on humanity's future is an overly simplistic way of thinking about the impacts of climate change. A camel stalked by Arctic heat complicates the notion of what it is like to "win" in a warmer world. It is Lovelock's questioning of what it means to win at this "global warring" wherein the value of his vision lies. A warmer world is likely to an incredibly inhospitable place for much of humanity, and so we must find a way to think and talk about climate change that acknowledges the depth of the problem and its implications for human civilization. To further illustrate Lovelock's vision, we will now take a closer look at the implications and insecurities of a warmer world.

II. EXAMINING HEAT THROUGH A CLIMATE JUSTICE FRAMEWORK

To help us examine the human impacts of climate change, we have developed a five-part framework for climate justice comprised of 1) health, 2) food and water, 3) security, 4) equity, and 5) justice. We think it is important that this framework not only hold up as a distinct set of categories, but also in the aggregate. Although each section of the framework can stand alone as its own category of impacts, many of the themes of climate justice overlap and are cross cutting. As a potential model for future institutions or agreements addressing climate justice, our framework aims to integrate solutions across disciplines and bridge traditionally separate issue areas. Heat impacts are just one set of climate issues that could be viewed through the lens of this framework. As discussed above, it is likely that the impacts of heat will be particularly devastating and pervasive.

1. Health

First, the warmer world is likely to be an unhealthy world. According to the U.S. Centers for Disease Control, extreme heat events kill more people annually than hurricanes, lightning, tornados, floods, earthquakes, and all other natural disasters combined.[21] And that is *before* figuring in a hotter climate. The IPCC reports that, "Cities that currently experience heat waves are expected to be further challenged by an increased number, intensity and duration of heat waves during the course of the century."[22] Elderly, low income, and socially isolated individuals are amongst the most vulnerable to heat waves, particularly if they live in cities, where the urban heat island effect can add between two and twen-

21. Centers for Disease Control and Prevention Extreme Heat, http://www.bt.cdc.gov/disasters/extremeheat/ (last visited Nov. 22, 2010).

22. IPCC, CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY, CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE IPCC (2007), *available at* http://www.ipcc.ch/ipccreports/ar4-wg2.htm.

ty-two degrees Fahrenheit to soaring temperatures.[23] This can be especially dangerous in places like northern Europe where people are more prepared to deal with extreme cold than extreme heat. It is estimated that over 50,000 people died (2000 per day in August) during the European Heat Wave of 2003, from temperatures just 3.6 degrees Celsius above normal.[24]

2. Food and Water

Coupled with heat-related dangers to public health, the warmer world is likely to be a hungry world. Heat can be devastating to crops, and in many places, climate change is already reducing agricultural productivity. A recent newspaper headline, ripped from the front page of the *San Francisco Chronicle*'s business section, reads "World's Wheat Crop Stressed."[25] According to the article, "Yields aren't keeping up with a world growing hungrier. Crops are stunted in a world grown warmer. A devastating fungus, a wheat 'rust,' is spreading out of Africa, a grave threat to the food plant that covers more of the planet's surface than any other."[26] The article continues, "In the face of leapfrogging prices, stagnating yields and shifting climate zones, wheat cannot be counted on to fill humankind's stomach in the future as it has since at least 7000 BC."[27] The article is right to call attention to the multitude of social and scientific factors that combine to create food insecurity.

One such factor that will compound all of this for much of Africa will be desertification. It is estimated that by 2050, there could be less than ninety reliable crop-growing days per year in parts of sub-Saharan Africa.[28] (See Fig. 2).

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23. U.S. ENVIRONMENTAL PROTECTION AGENCY, REDUCING URBAN HEAT ISLANDS: COMPENDIUM OF STRATEGIES (October 2008), *available at* http://www.epa.gov/heatisld/resources/compendium.htm.

24. WORLD HEALTH ORGANIZATION, IMPROVING PUBLIC HEALTH RESPONSES TO EXTREME WEATHER: A TECHNICAL REPORT BY THE WHO EUROPE (2009), http://ccsl.iccip.net/e92474.pdf. *See also* Earth Policy Institute, Plan B Updates (2006), *available at* http://www.earth-policy.org/index.php?/plan_b_updates/2006/update56.

25. Charles J. Hanley, *World's Wheat Crop Stressed*, S.F. CHRON., Nov. 14, 2010, at D1. *See also* Andrew E. Kramer, *Russia, Crippled by Drought, Bans Grain Exports*, N.Y. TIMES, Aug. 5, 2010, *available at* http://www.nytimes.com/2010/08/06/world/europe/06russia.html.

26. *Id*.

27. *Id*.

28. P.G. Jones & P.K. Thornton, *Croppers to Livestock Keepers: Livelihood Transitions to 2050 in Africa Due to Climate Change*, 12 ENVTL. SCI. POL'Y 427, 448 (2009), *available at* http://www.gecafs.org/documents/PP11Jones.pdf.

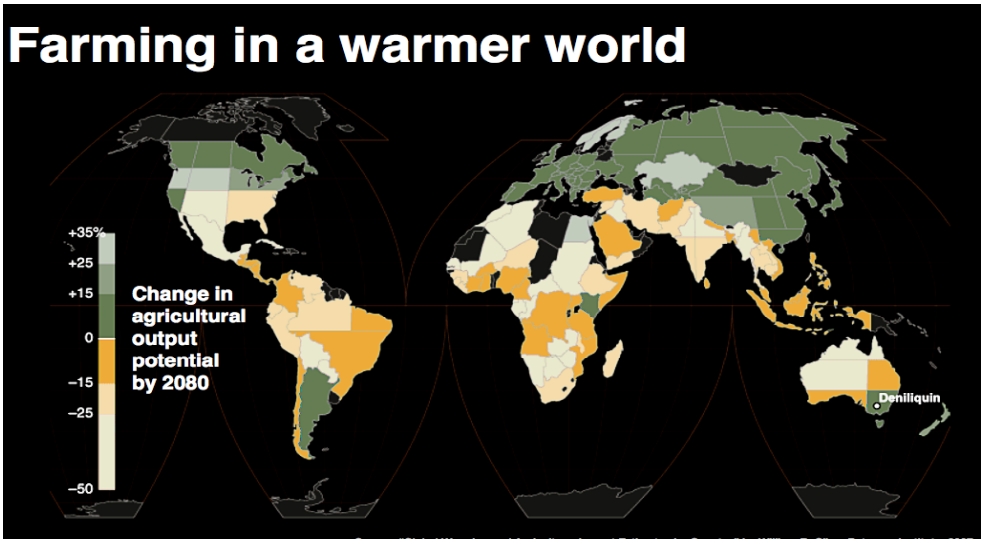

Figure 2. This figure displays how climate change is predicted to impact the world's food supply by 2080. [29]

The warmer world will lead to reduced yields of many staple grains: wheat, maize, rice, and soybeans. A rule of thumb is that for every one degree Celsius increase in temperature, cereal grain crop yields will decline by about 10 percent.[30] Importantly, this decline is attributable to temperature increases only; scientists did not factor in any changes in precipitation, pathogen responses, or other possible impacts on food production in their study. In hotter weather and with longer growing seasons, plants may mature faster, but overall yield is reduced.[31] In addition, current research reveals that the rising temperatures associated with climate change could significantly reduce the protein content of many of the major grains that people depend on for survival.[32] As Figure 2 indicates, some regions may benefit from climate change's hotter temperatures, but much of the Global South will see reduced yields of crops that are already in scarce supply. And, according to the map, Russia's crops were *supposed to benefit* from warmer weather.

The warmer world will also be a thirstier world. And there are already a lot of thirsty people. Take water scarcity, in India, for example,

29. CLINE, *supra* note 16.

30. David Battisti and Rosamond Naylor, *Historical Warnings of Future Food Insecurity with Unprecedented Seasonal Heat*, 323 SCIENCE 240, Jan. 9, 2009.

31. *Id*.

32. Daniel R. Taub, Brian Miller & Holly Allen, *Effects of Elevated CO2 on the Protein Concentration of Food Crops: a Meta-analysis*, 14 GLOBAL CHANGE BIOLOGY 565 (Mar. 2008), *available at* http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2486.2007.01511.x/full.

where the magnitude of drying far exceeds the capacity of afterthought or charity to provide an adequate response as people kill each other with swords in the slums of Bhopal over access to limited freshwater. India's 2009 record drought and shifting monsoon caused "the driest June for 83 years . . . exacerbating the effects of a widespread drought and setting neighbour against neighbour in a desperate fight for survival."[33] One hundred thousand people in Bhopal already rely entirely on the daily delivery of water from water tankers to meet their survival needs.[34]

The UN has warned for many years that water shortages will become one of the most pressing problems on the planet over the coming decades, with one report estimating that four billion people will be affected by 2050. What is happening in India, which has too many people in places where there is not enough water, is a foretaste of what is to come.[35]

Will we be delivering water to four billion people via tanker trucks in India? How about in the United States? The recent drought study by Dr. Dai mentioned earlier poses equal challenges for the United States, particularly for the Southwest.[36] Although the United States has avoided significant drying over the past fifty years due to natural climate variations, much of the United States will experience severe drying within the next few decades.[37] Imminent drying could cause water levels in the Colorado River and Lake Mead to drop, further endangering the water supply for the Southwest.[38] Dr. Dai also predicts droughts of devastating severity by 2030 in southern Europe, Southeast Asia, Brazil, Chile, Australia, and a majority of Africa.[39]

3. Security

The warmer world is likely to be a less secure world. Looking beyond the public health impacts of heat waves and the phenomenon of reduced agricultural productivity and water scarcity, the warmer world is going to be a more violent place. In fact, there is a phrase in psychology, "the heat hypothesis," which is used to describe this very phenomenon.[40]

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33. Gethin Chamberlain, *India Prays for Rain as Water Wars Break Out*, THE OBSERVER, July 12, 2009, *available at* http://www.guardian.co.uk/world/2009/jul/12/india-water-supply-bhopal.

34. *Id*.

35. *Id*.

36. *See* Dai, *supra* note 11.

37. *Id*.

38. Mike Orcutt, *A Cut-and-Dry Forecast: U.S. Southwest's Dry Spell May Become Long-Lasting and Intensify as Climate Change Takes Hold,* SCIENTIFIC AMERICAN, Oct. 29, 2010, *available at* http://www.scientificamerican.com/article.cfm?id=forecast-us-southwest-drought.

39. *See* Dai, *supra* note 11.

40. Craig A. Anderson, *Heat and Violence*, 10 CURRENT DIRECTIONS IN PSYCHOLOGICAL SCIENCE 33 (2001).

Studies of this relationship between human behavior and weather patterns date back to the time of Cicero (106–32 BC), although the topic was first empirically studied in the 1700s.[41] Research by criminal psychologist Ehor Boyanowsky, a professor at Simon Fraser University, shows that "elevated ambient temperatures lead to increased brain temperatures that result in cognitive dysfunction, emotional stress, and aggression," as well as increases in violent crime.[42]

According to another study by Iowa State psychologist Craig Anderson and sociologist Matthew DeLisi, "higher temperatures can increase aggression in myriad ways."[43] Based on their analysis of violent crime data for the period between 1950 and 2008, the researchers estimate that an increase of 4.4 degrees Celsius in the United States would result in more than 100,000 additional violent crimes nationwide per year.[44] But, the researchers caution, regular heat-fueled aggression is only one part of the problem. Migration, when it does take place, is likely to lead to even more violent behavior that can take on various forms of civil unrest. As DeLisi notes, "displacement and migration of people across borders can potentially lead to a lot more human conflict."[45] He points out the example of a post-Hurricane Katrina spike in Houston homicides, which has been linked to spars between Houston gangs and those gangs displaced from New Orleans.[46] The Katrina example may seem unique, but there is actually potential for increased violence across the world as shown in Figure 1. The map showcases how climate-induced environmental stresses will overlay one another and create or exacerbate political instability resulting in "climate change hot spots." The areas that face water insecurity also face food insecurity and these factors combine and can lead to the forced migration of climate refugees.

Without adequate access to food and water, and with more violence and aggression, it is not hard to see how many people in the warmer world could be less secure. How will we cope with a climate-dominated future? What kinds of needs will we voice? As the 1994 United Nations Development Programme's (UNDP) Human Development Report (HDR) describes:

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41. *Id.*

42. Ker Than, *Global Warming Making People More Aggressive?*, NAT'L GEOGRAPHIC NEWS, Mar. 24, 2010, http://news.nationalgeographic.com/news/2010/03/100324-global-warming-violence-aggression/.

43. *Id. See also* C.A. Anderson & M. DeLisi, *Implications of Global Climate Change for Violence in Developed and Developing Countries*, *in* SOCIAL CONFLICT AND AGGRESSION (J. Forgas, A. Kruglanski & K. Williams eds., forthcoming).

44. Than, *supra* note 42.

45. *Id.*

46. *Id.*

> For most people, a feeling of insecurity arises more from worries about daily life than from the dread of a cataclysmic world event. Will they and their families have enough to eat? Will they lose their jobs? Will their streets and neighborhoods be safe from crime? Will they be tortured by a repressive state? Will they become a victim of violence because of their gender? Will their religion or ethnic origin target them for persecution?[47]

Through its 1994 HDR, the UNDP promoted a new concept of security in the post-Cold War era, human security, as a more holistic alternative to the traditional twentieth century reliance on heavy militarization and notions of security centered on nation-states.[48] Security in a warmer world must take on new meanings, and many traditional security institutions are now beginning to reexamine what this new security paradigm could look like.

Every year, *Foreign Policy* magazine collaborates with The Fund for Peace to create an index that evaluates the security of the world's countries. In the summer of 2009, the index featured a special article devoted to the destabilizing effects of climate change. The article concludes, "[a]s global warming churns the world's weather, it's becoming increasingly clear that it's time to start thinking about the long term. In doing so, the West may need to adopt an even broader definition of what it takes to protect itself from danger."[49] Challenging the common discourse about global security threats related to Pakistan, the article suggests that "[w]hen it comes to the stability of one of the world's most volatile regions, it's the fate of the Himalayan glaciers that should be keeping us awake at night."[50] Perhaps, the article suggests, climate change is on par with terrorism as a threat to the United States and the global world order. According to a recent *New York Times* article, a new type of national intelligence work is being founded on the assumption "that the 21st century will be shaped not just by competitive economic growth, but also by potentially disruptive scarcities—depletion of minerals; desertification of land; pollution or overuse of water; weather changes that kill fish and farms."[51]

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47. UNITED NATIONS DEV. PROGRAMME, HUMAN DEVELOPMENT REPORT: NEW DIMENSIONS OF HUMAN SECURITY 1994, at 22 (1994), *available at* http://hdr.undp.org/en/reports/global/hdr1994/chapters/ [hereinafter 1994 HDR].

48. *See generally* SHANNON BEEBE & MARY KALDOR, THE ULTIMATE WEAPON IS NO WEAPON (PublicAffairs 2010).

49. Stephan Faris, *The Last Straw*, FOREIGN POL'Y, June 22, 2009.

50. *Id.*

51. Thom Shanker, *Why We Might Fight, 2011 Edition*, N.Y. TIMES, Dec. 12, 2010, *available at* http://www.nytimes.com/interactive/2010/12/12/weekinreview/12shanker.html?hp.

4. Equity

The warmer world is likely to be a more unequal world. The effects of climate impacts to health, food and water, and security will not be felt equally across the human race. One way that inequality could manifest is in the further marginalization of women. According to Heather Goldsworthy Davila, a research associate at the University of California, Irvine, Center for Unconventional Security Affairs, "gender, race, and class are very powerful intervening variables when considering human security," and "in situations of instability and insecurity, women are comparatively less well-off compared to men in their communities owing to their disadvantageous social status and the restrictions of their gender roles."[52] Indeed, studies of the 2003 European heat wave suggest that the excess mortality rate was 75 percent higher for women than for men.[53] And inequality between men and women is only one type of inequality that we will likely see in a warmer world. North versus south, rich versus poor, and born versus future generations will also be implicated. In fact, University of Chicago geophysical scientist David Archer's research shows that it will take several centuries for the planet's oceans to absorb roughly three quarters of anthropogenic carbon dioxide.[54] The remaining carbon will stay in the atmosphere for thousands of years, with ten percent remaining in the atmosphere for 100,000 years.[55] The people of the future will carry a huge burden as the world warms from destabilizing amounts of greenhouse gas emissions in the atmosphere.

5. Justice

A warmer world will likely be a less just world. Human rights law will be marginalized in an era of global climate change. A case decided by South Africa's Constitutional Court on October 8, 2009 is illustrative. *Mazibuko and Others v. City of Johannesburg and Others* was the first test case on South Africa's constitutional right to water.[56] The plaintiffs in the case were five impoverished residents of Phiri in Soweto, one of the poorest black townships that developed in Johannesburg dur-

52. Heather Goldsworthy, *Women, Global Environmental Change, and Human Security*, GLOBAL ENVIRONMENTAL CHANGE AND HUMAN SECURITY 218-19 (Matthew et al. eds. 2010).

53. Bernadette Valley, *Heat Waves, Water and Health*, WOMEN AND CLIMATE CHANGE BLOG, Jul. 10, 2010, http://womenandclimatechange.blogspot.com/2010/07/heat-waves-water-and-health.html.

54. DAVID ARCHER, THE LONG THAW: HOW HUMANS ARE CHANGING THE NEXT 100,000 YEARS OF EARTH'S CLIMATE 110 (Princeton University Press 2008).

55. *Id*.

56. *Mazibuko and Others v. City of Johannesburg and Others* 2010 (3) BCLR 239 (CC) (S. Afr.).

ing apartheid.[57] By shutting off their water supply, the plaintiffs contended that the city's water company was denying them one of their basic human rights.[58] Although lower courts found the plaintiff's arguments compelling, and thereby validated that economic and social rights should have a minimum core content, South Africa's high court rejected the minimum core content argument and instead adopted the commonly used standard for human rights—reasonableness in light of the theory of progressive realization.[59] This case illustrates an important concern about the feasibility of using human rights law to address climate harms. While principles of human rights have seen wide expansion since the Second World War, perhaps best illustrated by the United Nation's adoption of the Universal Declaration of Human Rights in 1948, climate change is likely to create a prolonged period of retraction as the conditions for the realization of these rights regress. Without a strong emphasis on building capacity for rule of law protections, as well as the realization of economic and social rights for billions of people, the concept of an ever-expanding ideal of democratic justice is likely to be just a fantasy.

The vivid picture of a warmer world is a world that is more dangerous, more violent, hungrier and thirstier, less secure, more unequal, and less just. The law must adapt. Our climate justice framework offers a useful starting place.

III. UNDERLYING CAUSES OF INSECURITY

The above sampling of the human impacts of a warmer world is merely the tip of a much larger iceberg. As influential as climate impacts are alone, it is the global response to these impacts that will inevitably shape our collective future. The story, in the end, will be less about heat, rising seas, or droughts. What we do—or do not do—as a global community to prepare for the impacts from climate change will ultimately shape the course of human history. We, particularly those of us who live in wealthy countries such as the United States, can choose adaptation policies that either secure global stability or plunge it further into chaos.[60]

57. *Id*. at 16.

58. *Id*. at 17.

59. *Id.* at 18-20.

60. In the United States, we narrate our future without regard for the future that we are actively creating. *See also* Applebome, *supra*, note 12 (noting that "There is plenty of concern about the economic future we're leaving for our children. As for urgency about the planet we're leaving them, that can slide until a more convenient time.").

Consider, for example, the political inaction on climate change in the United States. Despite Dr. Dai's "portrait of worsening drought,"[61] his report "didn't register on any political radar screens, amid Kentucky foot stomps, dead wrestlers, $2 billion in campaign spending and the pitched battles for control of Congress."[62] By ignoring reports of severely devastating temperatures and drought predictions, decision makers ignore the vivid picture painted across the full spectrum of our climate justice framework. The United States cannot afford to be optimistic about its future without redirecting its public policies and international priorities toward a more secure world, and this includes embracing adaptation policies that prioritize human security. Until the United States takes climate change seriously, it cannot claim to take its security seriously.

Two related issues frame U.S. political debates on climate change. First, both sides of the U.S. political spectrum struggle to grasp the full scope of the climate justice problem. The political Right simply denies the existence of anthropogenic climate change, while the political Left adopts a "green jobs" and "clean tech" frame for promoting climate policy. The green jobs rhetoric aims to revitalize an economy emerging out of recession while also addressing the climate crisis. Second, the dedication to capitalism at any cost is causing political leaders to lose sight of the importance of addressing climate change for global security. Although investments in clean tech and green jobs are critical in achieving U.S. energy independence, the scope of the climate crisis requires sensible solutions that emerge outside the current growth-centric economic paradigm—the very worldview that is responsible for much of the problem. James Gustave Speth, a pioneer in environmental law, blames growth-driven capitalism for much of the world's degradation, including the climate crisis:

> An unquestioning society-wide commitment to economic growth at any cost; powerful corporate interests whose overriding objective is to grow by generating profit; markets that systematically fail to recognize environmental costs unless corrected by government; government that is subservient to corporate interests and the growth imperative; rampant consumerism spurred by sophisticated advertising and marketing; economic activity now so large in scale that its impacts alter the fundamental biophysical operations of the planet—

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61. Press Release, University Corporation for Atmospheric Research, Climate Change: Drought may threaten much of globe within decades (Oct. 19, 2010), *available at* http://www2.ucar.edu/news/2904/climate-change-drought-may-threaten-much-globe-within-decades.

62. Applebome, *supra* note 12.

> all combine to deliver an ever-growing world economy that is undermining the ability of the planet to sustain life.[63]

Speth's scathing critique of the market's impact on the environment illustrates the difficulty of addressing an issue like climate change within the current economic and institutional confines. Our collective decisions seem to presuppose a nonsensical distinction between the environment and the economy,[64] and few seem to openly question that the market is the appropriate tool for addressing the climate crisis.[65]

The news media has done far too little to draw attention to this contradiction or the fact the climate change is far more than an environmental concern. Journalist Eric Pooley, recipient of the 1996 Gerald Ford Prize for Excellence in Reporting while serving as *Time*'s White House correspondent, analyzed media coverage of climate change for fifteen months and wrote a report titled, "How Much Would You Pay to Save the Planet? The American Press and the Economics of Climate Change."[66] Concluding that the press has badly misrepresented climate change by pigeonholing it as an environmental issue, Pooley wrote:

> In general, global warming is still being shoved into the "environment" pigeonhole, along with the spotted owls and delta smelt, when it is clearly to society's detriment to think about the subject that way. It is time for editors to treat climate policy as a permanent, important beat: tracking a mobilization for the moral equivalent of war.[67]

While journalists must play a bigger role in "tracking a mobilization for the moral equivalent of war," governments must actually mobilize on adaptation in order to confront a reality that looks "strangely like war."[68] Admittedly, this is a much bigger, harder to imagine, and more

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63. James Gustave Speth, *A New American Environmentalism and the New Economy*, Tenth Annual John H. Chafee Memorial Lecture on Science and the Environment, National Council for Science and the Environment (Wash. D.C., 2010), *available at* http://ncseonline.org/CMS400Example/uploadedFiles/01_NEW_SITE/4_Conference/2010_Green_Economy/Chafee%20Report%202010-Speth.pdf.

64. *See* Applebome, *supra* note 12.

65. Michael Shellenberger and Todd Norhaus, *Climate action plan: Innovate first, regulate later*, GRIST, (Nov. 16, 2010), http://www.grist.org/article/2010-11-16-climate-action-plan-innovate-first-regulate-later.

66. Eric Pooley, *How Much Would You Pay to Save the Planet? The American Press and the Economics of Climate Change*, Joan Shorenstein Ctr. on the Press Politics & Pub. Pol., (Discussion Paper Ser. No. D-49, 2009), *available at* http://www.hks.harvard.edu/presspol/publications/papers/discussion_papers/d49_pooley.pdf.

67. *Id*. at 5.

68. We borrow this phrase from Derrick Jensen, who uses it to discuss the human impacts of industrial deforestation practices around the world. *See* DERRICK JENSEN & GEORGE DRAFFAN,

expensive task than mitigating emissions. Yet within the growth-at-all-costs economic agenda—one that continues to incentivize a carbon-based economy while ignoring the human and security costs of such an approach—grim visions of a warmer world such as those painted by Lovelock, Hansen, and others remain marginalized.

The act of imagining a warmer world provides a legitimate opportunity to critically question whether the current political and economic orders actually serve us in building a better—and more secure—future for ourselves and for our children.

IV. THE IMPORTANCE OF ADAPTATION: CLIMATE CHANGE WILL AMPLIFY UNDERLYING CAUSES OF INSECURITY

Adaptation is the process of building resilience to climate impacts. It is becoming an ever more important task as major emitters such as the United States and China fail to adopt binding emissions reduction targets.[69] Shortly after taking office, the Obama Administration created an Interagency Climate Change Task Force tasked with supplying the administration with recommended actions in support of a national climate change adaptation strategy.[70] The recommendations offer specific near-term adaptation goals as well as recommendations for approaches to developing a national strategy.[71] Key policy goals include mainstreaming adaptation planning across the federal government, better integrating science into decision making, addressing key cross-cutting issues such as water and health, supporting international adaptation efforts, and building the capacity of the federal government to partner with and support adaptation at local, state, and tribal levels.[72] Although this task force is a good start, progress on adaptation is only in its initial planning phase. Despite Congress's failure to pass comprehensive climate legislation, mitigation policies to curb carbon pollution are still much more advanced than adaptation policies. Yet developing countries—"particularly those

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STRANGELY LIKE WAR: THE GLOBAL ASSAULT ON FORESTS (Chelsea Green Publishing Company 2003).

69. *See* U.N. Framework Convention on Climate Change Conference of the Parties, Copenhagen, Den., Dec. 7–19, 2009, Copenhagen Accord, Dec. 18, 2009, 4–7, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010), *available at* http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf.

70. THE WHITE HOUSE COUNCIL ON ENVIRONMENTAL QUALITY, PROGRESS REPORT OF THE INTERAGENCY CLIMATE CHANGE ADAPTATION TASK FORCE: RECOMMENDED ACTIONS IN SUPPORT OF A NATIONAL CLIMATE CHANGE ADAPTATION STRATEGY (2010), *available at* http://www.whitehouse.gov/sites/default/files/microsites/ceq/Interagency-Climate-Change-Adaptation-Progress-Report.pdf.

71. *Id.*

72. *Id*.

experiencing what they believe to be climate impacts now—are especially adamant that adaptation must secure equal status to mitigation."[73]

The 2007 IPCC report defines adaptation as "[t]he adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities."[74] In other words, adaptation is about "managing the unavoidable."[75] Often overshadowed by mitigation efforts to slow greenhouse gas emissions, adaptation gets weaker political support, fewer sound bites, and less attention from scholars and policymakers. To some, adaptation unpopularly suggests concession to a warmer world. Another reason adaptation is unpopular is because it requires unprecedented levels of cooperation and engagement. Unlike mitigation policy, the proposals for which are largely market-driven, adaptation policy necessitates a big role for governments. This is because without improved political and legal institutions to reduce poverty and inequity, environmental challenges such as climate change will continue to be a prominent factor in undermining economic and political stability. Governments, international cooperation, and the domestic rule of law must play a key role in ensuring future security and stability as we adapt to life in a warmer world.

The world needs real, not rhetorical, adaptation policies. Even if every person on the planet stopped emitting the greenhouse gases from fossil fuels today, elevated levels of carbon dioxide will linger in the atmosphere for thousands of years.[76] NOAA scientists have concluded that climate change is "largely irreversible for 1000 years"[77] and predicts dire impacts for the overall climate system as a result, such as a one thousand year Dust Bowl in the American Southwest, which is predicted to be irreversibly dry desert by 2050.[78] In a *Nature* article last year titled "Overshoot, adapt, and recover," IPCC scientists concede that because we will likely overshoot carbon emissions targets, adaptation policy deserves even more robust attention.[79] John Holdren, President Obama's science advisor, explained that "[w]e basically have three choices: mitigation,

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73. Richard Black, *IPCC Aims for Clarity and Relevance in New Report*, BBC NEWS, (Oct. 15, 2010), http://www.bbc.co.uk/news/science-environment-11551943.

74. IPCC, *supra* note 22.

75. *See* RORY SULLIVAN ET AL., MANAGING THE UNAVOIDABLE: INVESTMENT IMPLICATIONS OF A CHANGING CLIMATE, *available at* http://www.uss.co.uk/Documents/Managing%20the%20Unavoidable%20-Investment%20implications%20of%20a%20changing%20climate%20Nov%202009.pdf.

76. ARCHER, *supra* note 54, at 110.

77. Solomon et al., *supra* note 2.

78. Richard Seager et al., *Model Projections of an Imminent Transition to a More Arid Climate in Southwestern North America*, 316 SCIENCE 1181 (2007).

79. Martin Parry et al., *Overshoot, Adapt and Recover*, 458 NATURE 1102 (2009).

adaptation[,] and suffering. We're going to do some of each. The question is what the mix is going to be. The more mitigation we do, the less adaptation will be required and the less suffering there will be."[80]

Unequivocally, the world is getting warmer. Significant suffering could be alleviated by spending money on adaptation that provides better access to basic human services. Funding for public health, water delivery methods, and food storage facilities will reduce the degree to which people suffer while the United States and other countries ideally formulate a robust set of adaptation policies. However, given that 1) we have collectively evaded mitigation—the cheaper option of climate change prevention,[81] 2) neglected adaptation, and 3) chosen suffering by default, disaster relief and humanitarian aid are likely fallbacks. Yet humanitarian aid and voluntary charitable giving campaigns are an inadequate substitute for a comprehensive adaptation response.

Humanitarian response cannot stand in for climate adaptation policy because climate changes are becoming irreversible.[82] In a warmer world, drought endures; and in a state of permanent dry, drought will come again. Former United Nations Under-Secretary-General for Humanitarian Affairs Jan Egeland critiques humanitarian efforts for saving people's lives today so that they can die tomorrow.[83] Talking about Darfur at a 2008 Carnegie Council event, Egeland said:

> Number one, it's not enough with blankets and it's not enough to keep people alive if there is no security and, now, durable political solutions. The story of Darfur, as I see it, is that we treated it as if it was a natural disaster, whereas it was manmade, from A to Z, as a war. It is exacerbated by climate change, but it was manmade, as a disaster.[84]

Views of climate change as a series of natural disasters shape incomplete policy responses. Egeland's moral approach to climate

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80. Christopher Mims, *Putting the Midterm Elections in the Context of the Latest Climate Science (and Life as We Know it)*, GRIST (Nov. 4, 2010), http://www.grist.org/article/2010-11-03-putting-the-midterm-elections-in-the-context-of-the-latest. (citing Joe Romm, "Real adaptation is as politically tough as real mitigation, but much more expensive and not as effective in reducing future misery," CLIMATE PROGRESS BLOG (August 27, 2010)), *available at* http://climateprogress.org/2010/08/27/adaptation-mitigation-climate-chang/).

81. *See generally* Nicholas Stern, The Economics of Climate Change: the Stern Review (Cambridge University Press 2007). *See also* WORLD BANK, GLOBAL DEVELOPMENT FINANCE 2009: CHARTING A GLOBAL RECOVERY (June 22, 2009), *available at* http://go.worldbank.org/771Y6SFAT0.

82. Solomon et al., *supra* note 2.

83. Jan Egeland, Dir., Norwegian Inst. of Int'l. Affairs, *A Billion Lives: An Eyewitness Report from the Frontlines of Humanity*, Address before the Carnegie Council Public Affairs (Mar. 6, 2008), *available at* http://www.carnegiecouncil.org/resources/transcripts/0030.html.

84. *Id.*

change reveals how critically important a rights-based, long-term approach is to any human security agenda that informs climate adaptation. The U.S. military is critical to this approach because climate change makes bad things worse. It threatens human well-being for a multitude of issues and on a variety of scales. Some refer to climate change as a "threat multiplier," with the propensity to create global instability and even failed states.[85] In a 2007 report, the Center for Naval Analysis found that: "Unlike most conventional security threats that involve a single entity acting in specific ways and points in time, climate change has the potential to result in multiple chronic conditions, occurring globally within the same time frame."[86] In responding to these complex threats, the U.S. Department of Defense's 2010 Quadrennial Defense Review acknowledges that "climate change will shape the operating environment, roles, and missions" of the department.[87]

Lieutenant Colonel Shannon D. Beebe, the Senior Africa Analyst in the Office of United States Army Deputy Chief of Staff for Intelligence, has come up with a novel way of describing this new type of security. Beebe speaks about the importance of moving from a "kinetics-based" security, one that mobilizes planes and tanks, to a "conditions-based security," where the military becomes an active agent of social change by addressing creeping vulnerabilities.[88] Beebe calls for a shift from an algebraic to a calculus-based model of security, which would require military intelligence to adapt and respond better to multiple combinations of different permutations of future conditions.[89] Think about this as a shift from Normandy to 9/11. Omaha Beach required a sophisticated coordination of allied support to help U.S. Army Rangers enter France by sea, set against the bunker-driven munitions fire from occupying German infantry. While the battle was extremely difficult, there was a clear enemy and a clear strategy. The U.S. War on Terror, on the other hand, requires a very different set of strategies. Enemies, primarily loose affiliations of individuals with varying agendas, are often elusive. For example, a Chicago-bound printer toner cartridge, packed with explosives and shipped by an unknown woman in Yemen via UPS, becomes a

85. Faris, *supra* note 49.

86. THE CNA CORPORATION, NATIONAL SECURITY, AND THE THREAT OF CLIMATE 6 (2007), *available at* http://securityandclimate.cna.org/report/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf.

87. U.S. DEP'T OF DEF., QUADRENNIAL DEF. REVIEW REPORT 84 (2010), *available at* http://www.defense.gov/QDR/QDR%20as%20of%2029JAN10%201600.pdf#page=107.

88. Hannah Marqusee, *The Ultimate Weapon is No Weapon: Human Security and the New Rules of War and Peace*, THE NEW SECURITY BEAT BLOG (Nov. 5, 2010), http://newsecuritybeat.blogspot.com/2010/11/ultimate-weapon-is-no-weapon-human.html.

89. *Id.*

national security threat.[90] Commercial airplanes have become weapons of mass destruction.

Beebe's message is that both silver bullet solutions and the Cold War "winners versus losers" mentality have become obsolete in a warmer world. Indeed, Beebe is no lone renegade in the armed forces. On October 13, 2010, Admiral Mike Mullen, Chairman of the Joint Chiefs of Staff, made the following remarks at an Energy Security Forum in Washington, D.C.:

> As glaciers melt and shrink at a faster rate, water supplies have been diminishing in parts of Asia. Rising sea levels could lead to a mass migration and displacement similar to what we have seen in Pakistan's flood. And climate shifts could drastically reduce the arable land needed to feed a burgeoning population as we have seen in parts of Africa. The scarcity of and potential competition for resources like water, food and space, compounded by an influx of refugees if coastal lands are lost, does not only create a humanitarian crisis but creates conditions of hopelessness that could lead to failed states and make populations vulnerable to radicalization. These challenges highlight the systemic implications and multiple-order effects inherent in energy security and climate change.[91]

Heat makes glaciers melt. Melting glaciers pose tremendous challenges for the leaders within the armed forces to provide the type of military intelligence that adaptation researchers and policy makers need as they crafts laws and policies that leverage the interconnections between climate change, development, creeping vulnerabilities, and geopolitical stability. Adaptation policies must become an institutionalized part of security strategies in a warmer world, and vice versa. We believe that "human security" is a powerful conceptual framework for combining climate adaptation and global security goals.

V. REBRANDING CLIMATE ADAPTATION: PRIORITIZING HUMAN SECURITY IN A WARMER WORLD

> In the final analysis, human security is a child who did not die, a disease that did not spread, a job that was not cut, an ethnic tension that did not explode in violence, a dissident who was not silenced. Human security is not a concern with weapons—it is a concern with human life and dignity.

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90. *Yemen Mail Bomb 'Could Have Detonated over U.S.*', BBC News, (Nov. 10, 2010), http://www.bbc.co.uk/news/world-us-canada-11729720.

91. Admiral Michael Mullen, Chairman, Joint Chiefs of Staff, Address to the Energy Security Forum in Washington D.C. (Oct. 13, 2010), *available at* http://www.jcs.mil/speech.aspx?ID=1472.

> —United Nations Dev. Programme, Human Development Report.[92]

Because of the nature of climate change, typically intensified through creeping social and ecological vulnerabilities, we embrace a shift in the security narrative that focuses on "human security"[93] rather than state-based security. According to the UNDP in its 1994 HDR, "[t]he concept of security has for too long been interpreted narrowly . . . It has been related more to nation-states than to people . . . Forgotten were the legitimate concerns of ordinary people who sought security in their daily lives."[94] With these concerns in mind, we have chosen to borrow a definition of human security from the Global Environmental Change and Human Security project: "Human security is achieved when and where individuals and communities have the options necessary to end, mitigate, or adapt to threats to their human, environmental and social rights, have the capacity and freedom to exercise those options, and actively participate in attaining those options."[95] Thus, human security assumes a basic measure of political stability and encompasses a variety of basic human rights and entitlements, including substantive and procedural rights.

According to development scholar Des Gasper, "The concept of human security redirects attention in discussions of security, beyond the nation-state level, beyond physical violence as the only relevant threat/vector, and beyond physical harm as the only relevant damage."[96] Gasper challenges us to think beyond violence:

> The causes and knock-on effects of damage through violence are so ramifying that while violence appears convenient as a focus for data collection and subsequent model-building, the associated research and policy are forced to ramify. A narrow frame provides no self-

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92. 1994 HDR, *supra* note 47, at 22.

93. A note on semantics: We choose to adopt a human security lens for analyzing the human impacts of climate change, rather than an environmental security or climate security lens because we feel that this term is more accurate and inclusive of the basic needs of the world's most vulnerable people. As Geoffrey Dabelko noted in his foreword to a new volume on "Global Environmental Change and Human Security" published this year by MIT Press, the environmental security literature has primarily focused on the more narrow issue of natural resource depletion and its relationship to conflict thresholds. We agree with Debelko's analysis of the environmental security literature and we also believe that the term climate security fails to stand on its own as a concept that is significantly distinctive from human security. Because of the amplifying and threat-multiplying nature of climate change and its predicted impacts to human well-being, we have chosen to adopt a more widely accepted human security lens for analyzing the human impacts of climate change. *See generally* GLOBAL ENVIRONMENTAL CHANGE AND HUMAN SECURITY (Matthew et al. eds., MIT Press 2010).

94. 1994 HDR, *supra* note 47, at 22.

95. INT'L HUMAN DIMENSIONS PROGRAMME ON GLOBAL ENVTL. CHANGE, IHDP REPORT NO. 11, (Jun. 1999), http://www.ihdp.uni-bonn.de/html/publications/reports/report11/gehssp.htm.

96. Des Gasper, *The Idea of Human Security*, *in* CLIMATE CHANGE, ETHICS AND HUMAN SECURITY 23 (O'Brien et al. eds., 2010).

> enclosed analytical coherence. We cannot afford to ignore wider causes and effects, and to treat the latter as externalities that will be absorbed by the human and natural environments. The world contains too much interconnection, fragility, and risk of straying past tipping points.[97]

It is vital, then, that we study and understand these tipping points—climatic, political, and cultural alike. Although the climate refugee crisis may be one dominant tipping point, akin to Gasper's notion of a "convenient" problem,[98] there are many others to choose from in the climate context. The 1994 HDR outlined one set of human security indicators, which, it suggests, can combine to create a risk of more traditional nation-state breakdown: food insecurity, job and income insecurity, human rights violations, incidents of ethnic or religious conflict, rising regional inequities, and excessive military spending.[99] Importantly, the 2010 HDR, citing twentieth century Hungarian economic philosopher Karl Polanyi, notes that the role of governments will be critical to promoting human security and averting dangerous tipping points, as markets have generally been "very bad at ensuring the provision of public goods, such as security, stability, health and education."[100]

Climate change will make it even more difficult for governments to provide a measure of basic human security to their people. As the 2010 HDR notes:

> Climate change may be the single factor that makes the future very different, impeding the continuing progress in human development that history would lead us to expect. While international agreements have been difficult to achieve and policy responses have been generally slow, the broad consensus is clear: climate change is happening, and it can derail human development.[101]

Whether or not climate change derails the train of human development will be a question for scientists and policymakers alike. As Geoffrey Dabelko, Director of the Woodrow Wilson Center's Environmental Change and Security Program, notes, "A very important and distinctive contribution of human security is that it securitizes (makes a priority of) what individuals themselves see as their paramount concerns, and so pluralizes the meaning of security and opens up space for alternative security prac-

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97. *Id.* at 44.

98. *Id.*

99. *See* 1994 HDR, *supra* note 47, at 38.

100. UNDP, HUMAN DEV. REPORT, THE REAL WEALTH OF NATIONS: PATHWAYS TO HUMAN DEV. 2010, at 5 (2010), [hereinafter 2010 HDR].

101. *Id.* at 102.

tices."[102] If we can find a way to look at predicted climate impacts through a security lens, we can create opportunities for building social and ecological adaptive capacity across and throughout climate-impacted communities.

By promoting political rights and rule of law protections, human security provides a comprehensive lens through which to conceive of, implement, and evaluate climate policy. In many ways, human security may provide a *better* avenue than human rights laws for protecting human rights. This is particularly true for economic, social, and cultural rights, which have been systematically marginalized and under-enforced by governments and largely ignored by mainstream human rights organizations.[103] Like climate change itself, economic, social, and cultural rights violations are often plagued by the dilemma of attributing responsibilities and determining remedies.[104] Given the efficacy of human rights law thus far to provide for economic and social protections, relying on human rights protections in an era of global warming would be a mistake.

VI. ADAPTING TO A WARMER WORLD REQUIRES PRIORITIZING HUMAN SECURITY AT INTERNATIONAL, NATIONAL, AND LOCAL SCALES

As already argued, heat stress is a significant threat to human security in a warmer world. To protect basic human needs in an era of global climate change, international climate adaptation policies must provide an overarching framework for decentralized human security policies that strengthen rule of law protections for the provision of basic human services. State and local governments should build capacity for protecting human security by providing access to food and water, adequate health care and education, and equal access to courts.

The idea of making a warmer world safer by strengthening domestic rule of law may not seem politically feasible. One reason is that thirst, hunger, conflict, inequity, and injustice pre-date significant climate warming. Already, these stresses overwhelm the international community and undermine global stability. Also, climate change, by adding additional stresses such as heat, further compromises existing inequities and threatens global security, particularly in the developing world where rule of law protections are the weakest. However, adaptation policy crafted solely on what might be politically feasible rather than what might be necessary to avoid the devastating human impacts of a warmer world

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102. Geoffrey Dabelko, *Global Environmental Change and Human Security*, *in* CLIMATE CHANGE, ETHICS AND HUMAN SECURITY 9 (O'Brien et al eds., 2010).

103. Kenneth Roth, *Defending Economic, Social and Cultural Rights: Practical Issues Faced by an International Human Rights Organization*, 26 HUM. RTS. Q. 63 (2004).

104. *Id.* at 68.

will have significant implications for global human security. One consequence is that the ecological and social consequences of climate change may threaten democracy itself.[105]

The United Nations Framework Convention on Climate Change (UNFCCC) might provide one response to such threat. The UNFCCC is an international climate treaty dedicated to protecting global society from "dangerous anthropogenic interference with the climate system."[106] Yet, the UNFCCC does not explicitly protect human rights threatened by climate change. Although the international human rights discourse provides useful and important human rights standards and principles, actual human rights laws—particularly rights threatened by climate change such as the rights to food[107] and health[108]—are traditionally not enforced.

Alternatively, a human security approach to rights-based protections from climate harms might have more potential to be actionable given the geopolitical importance of security and security-based considerations. In addition, a focus on security may go farther than human rights protections to ensure the strength of the very institutions and democratic systems that are vital for overseeing and protecting human welfare and human rights. Below, we will address how laws and policies addressing human security concerns can be integrated into existing international frameworks for climate adaptation, and implemented at national and local scales.

A. International Climate Policy: The Human Rights Dilemma

Although climate change threatens justice all around the world, the plight of disappearing small-island states still anchors the debate on climate justice. The Malé Declaration is a major reason why. The Malé Declaration on the Human Dimension of Global Climate Change[109]—an initiative of the Association of Small Island States—is primarily responsible for elevating climate justice and the broader human rights impacts of climate change to the world stage. The Malé Declaration compelled the United Nations Office of the High Commissioner for Human Rights (OHCHR) to conduct a detailed study into the effects of climate change

105. *See* ROSS GELBSPAN, THE HEAT IS ON 153 (Basic Books 1998).

106. United Nations Framework Convention on Climate Change**,** art. 2, May 9, 1992, 1771 U.N.T.S. 107.

107. International Covenant on Economic, Social and Cultural Rights, art. 11, Dec. 16, 1966, 993 U.N.T.S. 3 (entered into force Jan. 3, 1976).

108. *Id.* at art. 12.

109. ASS'N OF SMALL ISLAND STATES, MALÉ DECLARATION ON THE HUMAN DIMENSION OF GLOBAL CLIMATE CHANGE (2007) (alternatively referred to as the Malé Declaration), *available at* http://www.ciel.org/Publications/Male_Declaration_Nov07.pdf.

on the full enjoyment of human rights.[110] The January 2009 OHCHR Report helped promote the consideration of the human rights impacts of climate change to the vulnerable peoples of the world. However, "the work of making that justice a necessary element of our global climate response remains incomplete."[111]

Indeed, protecting the human rights of climate-impacted peoples will require untested levels of international cooperation. Judging from recent international climate negotiations, the best means for achieving cooperation among over 190 countries remains unclear. The fifteenth meeting of the Conference of the Parties (COP 15) to the UNFCCC took place in December 2009 in Copenhagen, Denmark.[112] The major goal was to create a legally binding set of mitigation targets to set the post-Kyoto Protocol agenda. The parties to COP 15 did not achieve their goal. Instead, a small group of nations including the United States, Brazil, South Africa, India and China signed the non-binding Copenhagen Accord, of which the COP "took note" but did not formally adopt.[113] Although the process failed to produce any legally binding mitigation targets, "the result may be more an appraisal of the UNFCCC's governance process, which requires consensus among its [194] member countries, than a commentary on the overall state of international climate policy."[114] The sixteenth meeting of the COP recently concluded in Cancun, Mexico.[115] Although the parties to COP 16 had again reached a stalemate on any legally binding targets for curbing climate pollution, delegates successfully negotiated the Cancun Agreements—a package of separate agreements that reiterate key elements of the Copenhagen Accord. These agreements commit major economies to mitigation cuts, adaptation measures for vulnerable countries, and climate finance goals.[116]

The political nature of the Copenhagen and Cancun Agreements reveals that achieving consensus so far is only possible through the adoption of extra-legal agreements. Thus, the fate of the Kyoto Protocol—a legally binding agreement set to expire in 2012—has been described as a

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110. Office of the U.N. High Comm'r for Human Rights, *Report of the Office of the United Nations High Commissioner for Human Rights on the Relationship Between Climate Change and Human Rights*, U.N. Doc. A/HRC/10/61 (Jan. 15, 2009). *See also* Jennifer K. Barcelos et al., *The Three Degrees Conference: One Year Later*, 85 WASH. L. REV. 193, 195 (May 2010), *available at* http://threedegreeswarmer.org/wp-content/uploads/2010/05/Introduction1.pdf.

111. *Id*.

112. For information on COP 15, see Official Website of the U.N. Climate Change Conference in Copenhagen, http://unfccc.int/meetings/cop_15/items/5257.php.

113. *See* COP 15, *supra* note 69.

114. Barcelos et al., *supra* note 110.

115. For information on COP 16, see Official Website of the U.N. Climate Change Conference in Cancún, http://unfccc.int/2860.php.

116. *Id.*

"political landmine."[117] Despite its limitations, the UNFCCC still appears to be the most appropriate *existing* international legal body for eventually setting global emissions targets. And while top-down global emissions *mitigation* policy is critical, it is not clear that the UNFCCC structure is best suited for crafting meaningful *adaptation* policies, which require a much less centralized and a much more place-based approach. "A more promising approach to moving forward would be to split the climate-change problem up into different pieces and address the more tractable pieces in more specialized forums."[118]

Yet, the UNFCCC still needs to play a coordinating role for adaptation. Without the UNFCCC, state governments will lack the conceptual frameworks and the institutional capacity required for creating and funding meaningful adaptation programs in the short term. Long term, the UNFCCC must work more closely together with forces such as the United Nations OHCHR, U.S. Agency for International Development, the North Atlantic Treaty Organization, military officers, civilian commands, and local non-governmental organizations to oversee a new and robust legal and policy architecture that coordinates adaptation with efforts to secure human rights protections, development, and human security across the globe. Relegating international adaptation policy solely to the UNFCCC alone reflects the shortsighted and unhelpful perception that climate change is merely an environmental problem.

In the end, it remains to be seen to what extent the UNFCCC's adaptation policies will ensure the basic protection of human rights. In this vacuum, a new conceptualization of adaptation must emerge. Adaptation driven by human security concerns might be an effective supplement to both the UNFCCC and to international human rights law as a way to better match policy responses to the importance and scale of the climate crisis.

B. The Money Gap

Outside human rights concerns, another issue tied closely with adaptation is finance. Ultimately, climate finance is an equity issue. Poor nations argue that rich nations are historically responsible for causing

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117. Robert Stavins, *What Happened (and Why): An Assessment of the Cancun Agreements,* HARVARD PROJECT ON INTERNATIONAL CLIMATE AGREEMENTS, BELFER CENTER FOR SCIENCE AND INTERNATIONAL AFFAIRS, Harvard Kennedy School (Dec. 13, 2010, 10:45 PM), http://belfercenter.ksg.harvard.edu/analysis/stavins/?p=876.

118. DANIEL BODANSKY, "THE INTERNATIONAL CLIMATE CHANGE REGIME: THE ROAD FROM COPENHAGEN." Policy Brief, Harvard Project on International Climate Agreements, Belfer Center for Science and International Affairs, Harvard Kennedy School, (Oct. 2010), *available at* http://belfercenter.ksg.harvard.edu/publication/20437/international_climate_change_regime.html?breadcrumb=%2Fproject%2F56%2Fharvard_project_on_climate_agreements.

climate change and thus should pay to clean up the damage.[119] Wealthy nations have responded by pledging—in theory—to help finance poorer countries' adaptation to climate change. What has emerged has been referred to as the "money gap,"[120] or the gap between the amount of funds rich nations have pledged but have yet to commit. The money gap is a key issue in adaptation going forward.

At COP 15, signatories to the Copenhagen Accord pledged monies toward financing adaptation and mitigation in the developing world. The agreement proposes $30 billion of Fast Start Finance funds for the 2010–2012 period, and $100 billion per year by 2020.[121] Specifically, the agreement proposes "[n]ew multilateral funding for adaptation [that] will be delivered through effective and efficient fund arrangements, with a governance structure providing for equal representation of developed and developing countries."[122] As of October 27, 2010, it is estimated that developed countries have publicly pledged $28.34 billion of Fast Start Financing.[123] But the question is whether signatories will actually deliver on their pledges. There is no common reporting format, so pledges and deliveries are difficult to track.[124]

Another adaptation finance issue involves distribution mechanisms. At recent meetings in Copenhagen and Cancun, parties did not agree on a new mechanism for administering adaptation funding for pledges committed.[125] However, several adaptation finance mechanisms are already available under the UNFCCC—notably the Kyoto Protocol Adaptation Fund, The World Bank Pilot Program on Climate Resilience, and the Global Environment Facility (GEF).[126] But these mechanisms are controversial. Poor countries prefer that the funds flow through the Kyoto Protocol Adaptation Fund because they can access funding directly,

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119. For example, together the U.S. and China account for 38 percent of greenhouse gas emissions. *See* Margot Roosevelt, *U.N.Pacts Contain Small Steps But No Broad Accord on Climate Change*, L.A. TIMES, Dec. 12, 2010, *available at* http://www.latimes.com/news/local/la-me-climate-cancun-20101212,0,6973259.story.

120. *See* Andrew Revkin, *The Money Gap in the Climate Fight*, N.Y. TIMES DOT EARTH BLOG (Nov. 17, 2010), http://dotearth.blogs.nytimes.com/2010/11/17/the-money-gap-in-the-climate-fight/.

121. COP 15, *supra* note 69*,* at art. 8.

122. *Id*.

123. ATHENA BALLESTEROS ET AL., SUMMARY OF DEVELOPED COUNTRY 'FAST-START' CLIMATE FINANCE PLEDGES, WORLD RESOURCES INSTITUTE 3 (Oct. 27, 2010), *available at* http://www.wri.org/publication/summary-of-developed-country-fast-start-climate-finance-pledges.

124. Dennis Tirpak et al., *Guidelines for Reporting Information on Climate Finance* 1–32 (WRI, Working Paper, May 2010) *available at* http://pdf.wri.org/working_papers/guidelines_for_reporting_information_on_climate_finance.pdf.

125. Heather McGray, *From Copenhagen to Cancun: Adaptation,* WORLD RESOURCES INSTITUTE, May 13, 2010, *available at* http://www.wri.org/stories/2010/05/copenhagen-cancun-adaptation. *See also* Roosevelt, *supra* note 119.

126. *Id*

without a United Nations intermediary.[127] Rich countries prefer the funds to flow through the World Bank.[128] However, World Bank funds may force recipients of adaptation funds to take out loans, an unfair burden.[129] From a climate justice perspective, poorer countries should have equal power to direct which mechanisms are used to distribute adaptation finance.

The Declaration of the Climate Vulnerable Forum is one way in which poor countries have attempted to grasp the reigns of adaptation finance. The Declaration is an intentionally extra-legal and extra-political document that lives outside the UNFCCC framework, created by signatory states that feel ignored by the current law and policy infrastructure.[130] Kiribati, the Maldives, Bangladesh, Ghana, Nepal, Kenya, Vietnam, and Barbados—among other "low-emitting countries that are acutely vulnerable to climate change"[131]—signed the document, which preemptively declared that the UNFCCC's COP 15 meeting in Copenhagen would fail to prioritize their needs. The Declaration, among other things, seeks additional financing mechanisms to fund adaptation in developing countries. The Declaration "[c]all[s] upon developed countries to provide public money amounting to at least 1.5% of their gross domestic product, in addition to innovative sources of finance, annually by 2015 to assist developing countries make their transition to a climate resilient low-carbon economy."[132] Some commentators, though, have casually dismissed these extralegal declarations as cries for aid.[133]

However, the Declaration also calls upon international climate policy to address human rights, health, and security concerns specifically for those forced to relocate or who are left stateless. Not all signatories to the Declaration are island nations. But the threat of relocation may be just as compelling to states in Africa, such as Ghana, where migration is already taking place due to poverty and inequity,[134] much more common drivers of displacement than climate change alone.[135] Such a demand for rights-based protections from climate and non-climate threats alike calls

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127. *Id.*

128. *See* Roosevelt, *supra* note 119.

129. *See* McGray, *supra* note 125.

130. Declaration of the Climate Vulnerable Forum, (Nov. 10, 2009), *available at* http://centralcontent.fco.gov.uk/central-content/campaigns/act-on-copenhagen/resources/en/pdf/climate-vulnerable-forum.

131. *Id.*

132. *Id.*

133. A Three Degrees Project collaborator made this comment off the record during a meeting.

134. Sam Knight, *The Human Tsunami*, FINANCIAL TIMES, (Jun. 19, 2009), *available a*t http://www.ft.com/cms/s/2/bb6b0efc-5ad9-11de-8c14-00144feabdc0.html#axzz164C3TcjI.

135. Jon Barnett & Michael Webber, *Migration as Adaptation*, *in* CLIMATE CHANGE AND DISPLACEMENT: MULTIDISCIPLINARY PERSPECTIVES 37, 38 (Jane McAdam ed., 2010).

for strengthened governments, institutions, and domestic rule of law—not just more aid. For, "[w]ithout improved political and economic institutions to reduce poverty and marginality, environmental change will continue to be an important proximate factor in migration decisions."[136] Those who might scoff at the Declaration because it threatens the global wealth balance are avoiding confronting the inequities ripe to adaptation. Stephen Castles, Research Professor of Sociology at the University of Sydney and Associate Director of the International Migration Institute at Oxford, puts it this way:

> Weak states are not a fact of nature, but a result of inequality based historically on colonialism and, today, on neo-liberal globalization. Decrying potential climate induced displacement as a threat to the security [or wealth] of developed countries misses the point . . . that climate-induced displacement is a result of the human insecurity imposed on the South in the current global order.[137]

The money gap is a thus a foreseeable consequence of many unresolved equity issues. First, wealthy nations—by throwing money at the problem—continue to avoid real efforts to mitigate impacts by being charitable. In an economy buried under global recession, it will inevitably prove difficult for countries to deliver upon even the most well-intentioned pledges. This is the case even though helping poor people in far-off places "adapt" to climate change seems—quite unfairly—to be preferable to reducing emissions at home. Second, depending on which mechanisms are used to distribute funding, the billions of dollars pledged for adaptation have tremendous potential to reinforce patterns of global inequity. It is quite problematic that no clear legal means for resolving disputes exist once monies begin to flow, and it is unclear who will arbitrate such issues as corruption charges, fights over entitlements, and claims of unfair distribution schemes. Finally, and perhaps most importantly, how much will climate change alone factor into which impacts warrant resources from adaptation funds? In his *New York Times* blog Dot Earth, opinion reporter Andy Revkin frames the question this way:

> The issue is that all commitments under the language of the foundation climate treaty, the Framework Convention on Climate Change, relate only to climate change driven by the buildup of greenhouse gases. Who arbitrates what portion of a sub-Saharan drought is from this background warming and which part is driven by patterns of ex-

136. *Id.*

137. Castles, *supra* note 8.

> treme drying etched in African climate history? No one, of course.[138]

To the contrary, the answer is not "no one." International human rights bodies, as well as world organizations that promote development and protect human security, should arbitrate. Debate over which human impacts are climate-caused and which ones are not should not be argued when an individual's very survival—and global security for that matter—is at stake. Harms that are "[t]he result of sudden or gradual environmental disruption that is consistent with climate change and to which humans more likely than not contributed"[139] should be the basic standard for evaluating where adaptation monies flow. As such, only the absolute minimal level of causation is necessary and no more. Standards for determining access to adaptation finance must be consistent with human rights laws and norms and with aims to protect human and global security.

C. Regionalized Harms Necessitate Regionalized Solutions

According to Chris Field, co-chair of the IPCC working group on impacts, adaptation and vulnerability, climate impacts are poorly known and understood.[140] Thus, the IPCC is focusing more of its research in this direction.[141] In order to prioritize which impacts receive adaptation funding, the IPCC's research on global climate impacts must then be downscaled and integrated into localized policies for response and action. Universities, the military, and civil society groups play a significant role in this effort.

For example, Dr. Richard Anyah, Professor of Atmospheric Sciences at the University of Connecticut, is studying meteorology and atmospheric science in Kenya, focusing on developing regional climate change scenarios. He stresses the importance of regionalizing the problem of climate change and its solutions.[142] Harms must be contextualized for impacts to translate and relate to impacted communities. In that vein, Dr. Ton Dietz, a Professor of Geography at the University of Amsterdam, promotes "needlework policy," calling for development and adaptation plans sensitive to local conditions and perceptions of climate change

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138. *See* Revkin, *supra* note 120.

139. Docherty and Giannini, *supra* note 7, at 361.

140. *See* Richard Black, *IPCC Aims for Clarity and Relevance in New Report*, BBC NEWS, (Oct. 15, 2010), http://www.bbc.co.uk/news/science-environment-11551943.

141. *See* IPCC, *Agreed Reference Material for the IPCC Fifth Assessment Report*, *available at* http://www.ipcc.ch/pdf/ar5/ar5-outline-compilation.pdf. *See also* Black, *id*.

142. Yale Environment 360 and Media Storm, *When the Water Ends: Africa's Climate Conflicts*, http://e360.yale.edu/feature/when_the_water_ends_africas_climate_conflicts/2331/ (last visited Nov. 23, 2010).

rather than a one-size-fits all approach.[143] Needlework policy promotes bottom-up approaches to adaptation—strategies and responses that impacted communities craft themselves. Bottom-up approaches are one of the key principles of human security, and thus should play a critical role in any sound adaptation policy agenda or in setting funding priorities.[144] "This decentralized approach will not be sufficient in itself to solve the climate-change problem. But it offers a useful supplement to the UNFCCC process and will be all the more important if the UNFCCC continues to be stalemated."[145]

Thus, climate adaptation policies should be coordinated but not universal. They should be targeted to respond to particularized impacts on specific regions, places, and communities. They should be flexible enough to respond to improvements in science. And, perhaps most importantly, they should invest in capacity building. Communities are already impacted by climate change and they are already adapting. Yet building capacity so that communities can more effectively respond to *current* risks is critical for adaptation. One UNDP working group identified capacity building as a key strategy for addressing climate change adaptation:

> [S]trengthening national and local capacities to manage climate-related risks, as they can be understood now, is the best strategy to be able to manage more complex climate risk in the future. It is also more feasible to mobilize national and international political and financial resources to manage an existing risk scenario than to address a hypothetical future scenario. Medium and long-term adaptation must begin today with efforts to improve current risk management and adaptation. And lessons from current practices along with the notion that learning comes from doing are of critical importance.[146]

For example, right now, decision makers could work with local groups to take many productive steps, such as 1) suspend taxes[147] or provide free seeds during droughts; 2) provide pest- and mold-proof insu-

143. *See* Knight, *supra* note 134.

144. *See* BEEBE & KALDOR, *supra* note 48.

145. *See* BODANSKY, *supra* note 118.

146. UNDP, UNDP EXPERT GROUP MEETING, INTEGRATING DISASTER REDUCTION WITH ADAPTATION TO CLIMATE CHANGE, A CLIMATE RISK MANAGEMENT APPROACH TO DISASTER REDUCTION AND ADAPTATION TO CLIMATE CHANGE 18 (2002), *available at* http://www.undp.org/cpr/disred/documents/wedo/icrm/riskadaptationintegrated.pdf.

147. *See* Knight, *supra* note 134.

lated storage facilities for grains;[148] 3) change hunting seasons to coincide with shifting seasonality patterns of caribou; and 4) initiate programs to train citizens from climate impacted communities in meteorology or in the use of regional climate models.[149] In addition, assuming that researchers continue to document an increase in violent crimes during excessively hot days, doctors and psychologists could work with law and policy makers to debate the formation of a new criminal defense for crimes committed under conditions of excessive heat. International migration policies could incorporate protections for the rights to work and job training, to leave and re-enter, to health (including mental health care and counseling), and to additional protections, such as social security, land title, citizenship status, and cultural values.[150] Finally, local law and policy makers could prioritize adaptation strategies based on what security means to their communities.[151] Policymakers should then build local and institutional capacity to anticipate risks to that security and craft adequate local responses based on local knowledge and priorities.

The above list of localized law and policy changes is suggestive of the types of important immediate "climate" adaptation policies capable of protecting human rights and furthering human security in a warmer world. Strengthening the rule of law—the legitimacy and effectiveness of laws, policies, and institutions such that 1) people understand and activate their rights, and 2) lawyers and judges actively enforce these rights—is essential to strengthening local adaptation capacity. Laws to suspend taxes during times of severe drought, mitigate criminal sentences for prisoners who commit crimes linked to heat stress, and shift hunting seasons when seasonality disrupts migration patterns, may be perceived as insignificant and unrelated to climate adaptation. But once climate problems are dissected, one discovers that small, seemingly insignificant solutions have considerable leverage for improving peoples' lives. Politically decentralized actions that prioritize human security—whether through ensuring access to clean drinking water or strengthening

148. Michael Glantz, *Are Famines so Difficult to Predict*, UNIVERSITY CORPORATION FOR ATMOSPHERIC RESEARCH (2007), *available at* http://ccb.colorado.edu/ijas/ijas.html (last visited Nov. 22, 2010).

149. *See* International Research Institute for Climate and Society (IRI), http://portal.iri.columbia.edu/portal/server.pt (last visited Nov. 23, 2010). *See also* Cathy Vaughan, *Democratizing Seasonal Forecasting in Latin America*, IRI (Nov. 3, 2010), http://portal.iri.columbia.edu/portal/server.pt?open=512&objID=699&parentname=CommunityPage&parentid=0&mode=2&in_hi_userid=2&cached=true (last visited Nov. 22, 2010).

150. *See* Castles, *supra* note 8, at 246.

151. *See* Marqusee, *supra* note 88. Col. Beebe spent one year interviewing Africans—from cab drivers, to academics, NGOs, and military leaders—about their definition of security. He learned that "creeping vulnerabilities," such as climate change and poverty, factored more into peoples' views on security than did physical violence.

public health systems—must be packaged in effective frameworks that define overarching goals and coordinate actions across multiple scales of government and society. Our climate justice framework is one example. (See Sec. II.)

The task of creating frameworks for adaptation that are culturally competent, localized, multidisciplinary at heart, and capable of supporting a "calculus-based" model of human security with all of its combinations of permutations, makes mitigation seem easy. Adaptation is indeed much more complicated. Yet it offers many co-benefits, including the opportunity to securitize human rights and build a better future. As "adaptation is more than merely avoiding climate risks, and must accommodate peoples' rights and aspirations for the future."[152]

VII. CONCLUSION

Our own heat hypothesis—that global security will be more impacted by heat stress than by rafts of climate refugees relocating to escape rising seas—is neither meant to undermine the plight of peoples who may eventually need to relocate due to rising sea levels nor to discourage the remarkable efforts made to protect the rights of "climate change refugees" or the human rights of peoples fighting for survival on small-island states.

The attention on the climate refugee constituency, evidenced by countless media articles and recent legal scholarship drafting a separate refugee conventions for climate refugees[153] is by no means undeserved. But law and policy makers should neither get complacent nor stop there. Instead, we argue that forced migration should be considered "a matter of last resort when other adaptation strategies have failed, rather than an automatic response to environmental degradation."[154] The emphasis on a more complex set of interactions—as framed by the ubiquitous impacts of heat that necessitate a human security narrative—has to a large extent been neglected. This is unacceptable. To protect human dignity in the face of creeping vulnerabilities, for which climate change is but one cause and migration is but one response, adaptation policies must both protect the "right to stay as well as the right to leave, allowing people to choose the response that best suits their needs and values."[155] As argued

152. Barnett & Webber, *supra* note 135, at 51, *citing* W. NEIL ADGER ET AL., *Adaptation to Climate Change in the Developing World,* 3 PROGRESS IN DEVELOPMENT STUDIES 179 (2003).

153. *See* Docherty and Giannini, *supra* note 7.

154. Jane McAdam, *Introduction* to CLIMATE CHANGE AND DISPLACEMENT: MULTIDISCIPLINARY PERSPECTIVES 1, 4 (Jane McAdam ed., Hart Publishing 2010).

155. Barnett & Webber, *supra* note 135.

earlier, adaptation policies must not favor one universal response, such as permanent migration.[156] Instead:

> Responses need to be guided by considered, well-informed research, not by sensationalism, assumptions or fear. To oversimplify the causes of movement, misuse terminology, and not listen to the voices of affected populations obscures the multiplicity of factors that need to be considered in any formal response. As some scholars have observed, it is essential to consider 'the socio-cultural-political-economic environment that communities exist in; the cognitive processes of the people experiencing the impact of climate change; the individual, household, and community attitudes to migration and migration outcomes; and the type of climate stimulus that migration may be responding to.'[157]

With this article, we wish to make a compelling case that in addition to small island states, there are countless other global hot spots where migration is just one factor as climate change, human security, and economic security collide.[158] Heat will exacerbate the existing conflicts prone in these areas, which requires adaptation policies tailored to a human security agenda.

One of these global hot spots is Australia. Australia is the world's driest continent,[159] deemed to become one "inevitable" home for climate refugees from the Pacific islands.[160] In response, Australia has been pressured to open its borders to climate refugees.[161] Ross Garnaut, former climate change adviser to the Australian government, has stated that "[t]he rest of the world expects that and, in the end, we're likely to accommodate that, so there's a solution there."[162] However, "[i]n the three-degree [warmer] world, far more of Australia will burn."[163] More bush fires may make Australia's landscape less tolerable for displaced climate refugees attempting to make a new home there. Australia has a long history with bush fires, but as temperatures climb, bush fires will endanger more people as fire risk and intensity multiply with increasing drought and heat. These extreme conditions will cause a rise in the

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156. *Id.* at 50.

157. McAdam, *supra* note 154, *citing* D. KNIVETON ET AL., *Climate Change and Migration: Improving Methodologies to Estimate Flows* 33 IOM Migration Research Series 57 (2008).

158. *See* SCHUBERT ET AL., *supra* note 3.

159. *Living with Drought*, AUSTRALIAN BUREAU OF METEOROLOGY, http://www.bom.gov.au/climate/drought/livedrought.shtml (last visited Nov. 22, 2010).

160. *Climate Refugees in Australia 'Inevitable*,' AUSTRALIAN BROADCASTING CORPORATION, (Dec. 11, 2009) http://www.abc.net.au/news/stories/2009/12/11/2769403.htm.

161. Neil MacFarquhar, *Refugees Join List of Climate Change Issues*, N.Y. TIMES, (May 29, 2009) *available at* http://www.nytimes.com/2009/05/29/world/29refugees.html.

162. *See Climate Refugees*, *supra* note 160.

163. LYNAS, *supra* note 18, at 143–46.

spread of vector-borne disease (such as dengue fever), agricultural collapse, rationed water, burned houses, and economic loss for the everyday person and for Australia as a whole,[164] with no legal redress for damages. Climate refugees, if treated as second-class citizens, may be particularly vulnerable. Thus, the promise that Australia may provide a safe haven for climate refugees may be an empty one. Migration as a solution that solves all problems may not be as feasible as Australia, or the world, had hoped. Human security strategies may help better connect the dots.

Another example comes from Carteret Islands of Papua New Guinea. Although media coverage of the issue singled out the refugee crisis, as you will read below, relocation is not the whole story. Due to eroding shorelines, in 1984 the government of Papua New Guinea relocated ten families from the Carteret Islands to the main island of Bougainville, who later returned when fleeing from civil war.[165] The persistent, unanswered question seems to be where in a warmer world can you relocate coastal communities if there is persistent global instability? In 2006, in response to a lack of government assistance with efforts to relocate, the Carterets' Council of Elders formed a nonprofit organization to assist most of the Carterets' population of 3300 in voluntarily relocating to Bougainville.[166] The media branded the peoples of the Carterets the world's first climate refugees.[167] However, the climate refugee label means nothing to Carteret Islander Ursula Rakova, who wrote:

> [T]he story you have not likely read is the one of government failure and the strategy we developed in response, so as to engineer our own exile from a drowning traditional homeland. Carterets' people are facing, and will continue to face, many challenges as we relocate from our ancestral grounds. However, our plan is one in which we remain as independent and self-sufficient as possible. We wish to maintain our cultural identity and live sustainably [sic] wherever we are. While we call on the Papua New Guinea government to develop policy, we are not sitting by. Instead, we now want to see the media headlines translate into practical assistance for our relocation program. And we hope our carefully designed and community-led action plan can serve as a model for communities elsewhere that will be affected by climate change in the future.[168]

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164. *Id*.

165. *See* Rakova, *supra* note 9.

166. *Id.*

167. John Vidal, *Pacific Atlantis: First Climate Change Refugees*, THE GUARDIAN (Nov. 25, 2005), http://www.guardian.co.uk/environment/2005/nov/25/science.climatechange.

168. *See* Rakova, *supra* note 9.

In theory, linking human security to adaptation efforts is a first step to offering adequate adaptation responses that protect human rights, uphold human dignity, and achieve climate justice. Because, "[h]uman security evokes the faces of the world's poor, in rural and urban areas, struggling to earn a living, the name itself places the individual and human well-being at center stage, revealing the insufficiency of a state-based approach to security."[169] The exacerbation of poverty through climate change will further challenge the traditional, discrete models of security infrastructures, humanitarian aid efforts, and environmental policies. At the same time, these interconnections challenge us "to examine larger questions of human vulnerability, the dynamics of conflict and cooperation, and, ultimately, equity and justice."[170]

If a human security framework delivers an innovative and coherent way of thinking about the human dimensions of climate impacts in our increasingly interconnected and interdependent world, it may provide the most useful lens for crafting and critically evaluating climate adaptation policy.

In this essay, we have advocated the strategy of addressing climate adaptation by applying a human security perspective. And although we focus explicitly on climate adaptation, we do not wish to diminish the importance of climate mitigation. In order to limit climate impacts on the world's most vulnerable peoples, the human community must also work actively to de-carbonize the future by investing in critical renewable energy sources and infrastructure. One key area of overlap between our human security focus and many climate mitigation efforts is the idea of energy security—the focus of Admiral Mullen's speech[171] and one permutation of complex variables important to Col. Beebe's call for a "calculus-based" security model.[172] Although energy security is an important component of human security, it hides the full story. Human security, the broader lens we apply in this essay, more fully embodies the type of holistic thinking that we argue is required to solve the complex problems of a warmer world. For it is our basic social, political, and economic institutions—despite any faint pride that we may boast about our modest investments in renewable energy development—that will ultimately determine the extent of climate change's impacts on humanity in a warmer world.

Additionally, the prospect of a thriving renewable energy landscape appears to be bleak. Although investment in renewable energy is

169. Goldsworthy, *supra* note 52, at ix.
170. *Id.*
171. *See* Mullen, *supra* note 91.
172. *See* Marqusee, *supra* note 88.

critical, we cannot yet rely on the benefits. Energy forecasts for the year 2035 reveal the domination of oil despite the availability of alternative energy sources today.[173] Thus, planning for the future demands planning for the worst-case scenario, a future where carbon dioxide remains largely un-caged. The consequences of inaction are not difficult to imagine: picture an image of the sun throwing itself across a barren Arctic horizon while a camel rises on its haunches in the heat. People are hungry and thirsty and being forced to relocate from their homes. Governments crumble. Rights are systematically violated. Cultures disappear. All of these harms take place on a scale that we have never dared to imagine. Without regimes in place now to achieve drastic emissions reductions, more comprehensive adaptation planning will be critical to meet the needs of a desperate human population. Human security ought to be a major component of that planning process.

173. Aaron Smith, *Energy in 2035: China and Oil Dominate*, CNNMONEY.COM (Nov. 9, 2010), http://money.cnn.com/2010/11/09/news/international/energy_forecast_china_oil/index.htm.